Emotion regulation and disordered eating: The distinct effects of body image-related cognitive fusion and body appreciation

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Abstract

Different emotion regulation processes may influence the impact of a negative perception of one's own weight and body image on the engagement in disordered eating. In this regard, the present study aims to clarify the distinct effects of cognitive fusion and body appreciation in the relationship between body image discrepancy and disordered eating, while controlling the effect of BMI, in a sample of 369 women.

Results indicated that women who perceived their body as significantly discrepant from the socially idealized thin figure show greater tendency to engage in disordered eating behaviours. Notwithstanding this direct association, the impact of negative body image evaluation in disordered eating seems to be partially carried by higher body image-related cognitive fusion and lower body appreciation. Furthermore, results offer relevant contributions by providing empirical support for the importance of targeting and cultivating cognitive defusion and self-compassionate attitudes as protective emotion regulation strategies against eating psychopathology.

Regulação emocional e comportamento alimentar perturbado: O impacto distinto da fusão cognitiva e de uma atitude de apreço em relação à imagem corporal

Resumo

Diferentes processos de regulação emocional parecem estar envolvidos na relação entre a avaliação negativa da imagem corporal e a psicopatologia alimentar. O presente estudo pretendeu clarificar, numa amostra de 369 mulheres, os efeitos distintos da fusão cognitiva e do apreço pela imagem corporal na relação entre a discrepância sentida entre o corpo real e idealizado e o comportamento alimentar perturbado, quando controlado o efeito do IMC.

Os resultados indicaram que mulheres que percecionam o seu corpo como significativamente discrepante do padrão valorizado na sociedade atual têm uma maior tendência para apresentar comportamentos alimentares perturbados. No entanto, esta relação é parcialmente explicada por maiores níveis de fusão cognitiva em relação à aparência física e por um menor apreço pela própria imagem corporal.

Estes resultados constituem um contributo significativo ao sublinharem a relevância da promoção de desfusão cognitiva e de atitudes autocompassivas enquanto estratégias de regulação emocional protetoras da psicopatologia alimentar.

Palavras-chave: discrepância da imagem corporal; fusão cognitiva em relação à imagem corporal; imagem corporal positiva; psicopatologia alimentar.

INTRODUCTION

Several authors have argued that weight and body image dissatisfaction constitute key factors in explaining eating psychopathology (Neumark-Sztainer, Wall, Story, & Perry, 2003; Stice, Marti, & Durant, 2011). In fact, research has documented that women who present higher Body Mass Index (BMI) and higher body image discrepancy (that is, who perceive their body as significantly discrepant from the socially and culturally ideal thin figure; Mond et al., 2013) have a higher tendency to engage in disordered eating attitudes and behaviours, such as dieting, binge eating, purging or excessive exercise (Ferreira, Palmeira, & Trindade, 2014; Mendes, Ferreira, & Marta-Simões, 2016; Stice et al., 2011). Despite the direct impact of these body image-related variables, there is evidence that its effect on eating psychopathology may be influenced by different emotion regulation processes (Ferreira et al., 2014; Mond et al., 2013; Pinto-Gouveia et al., 2014; Segal, Teasdale, & Williams, 2004; Trindade & Ferreira, 2014). Several accounts have pointed out different processes used by individuals to cope with weight and body image which seem to explain disordered eating behaviours, and seem to hold emotional and physical health consequences (Mond et al., 2013; Muennig, Jia, Lee, & Lubetkin, 2008).

According to the Acceptance and Commitment Therapy (ACT; Hayes, Luoma, Bond, Masuda, & Lillis, 2006), human suffering is not originated from the occurrence or by the content of undesired experiences (such as negative thoughts or perceptions about one's body image), but rather from the relationship established between the individual and such internal events (Segal et al., 2004). Specifically, the ACT underlines the role of psychological inflexibility as a main foundation of human distress and suffering (Hayes, Strosahl, & Wilson, 2012). A greater tendency to be psychologically inflexible, i.e., to be

unable to accept and to act flexibly in the presence of undesired thoughts, emotions and sensations, is associated by literature with other central pathological processes, namely experiential avoidance and cognitive fusion (Hayes et al., 2006, 2012).

Body image-related difficulties and eating psychopathology have also been defined as being raised by psychological inflexibility (Merwin et al., 2011). In fact, empirical studies have suggested the pernicious role of psychological inflexibility-related processes in eating psychopathology by showing that they contribute for the increase of negative body image and eating disorder symptoms (e.g., Ferreira, Pinto-Gouveia, & Duarte, 2011; Mancuso, 2016; Sandoz, Wilson, & DuFrene, 2010; Timko, Juarascio, Martin, Fahertya, & Kalodnera, 2014; Wendell, Masuda, & Le, 2012). In accordance, disordered eating may be conceptualized as a set of maladaptive strategies to avoid unwanted body image-related internal experiences (e.g., Ferreira et al., 2014; Ferreira & Trindade, 2014; Wendell et al., 2012). Psychological inflexibility is indeed potentiated when one gets entangled with one's own internal events (e.g., feelings, thoughts) and, consequently, perceives and reacts to its content in a literal way, that is as an absolute truth or representation of reality (Hayes et al., 2006). This process is defined as cognitive fusion (Hayes et al., 2012) and, although research about its specific implications on disordered eating is scarce, several studies have highlighted its relevant role in the development and maintenance of body image and eating psychopathology (e.g. Hayes & Pankey, 2002; Ferreira, Trindade, Duarte, & Pinto-Gouveia, 2013). Furthermore, several accounts suggest that the promotion of psychological flexibility related with body image may be an important protective emotion regulation strategy against disordered eating (e.g., Ferreira et al., 2013; Hayes & Pankey, 2002; Sandoz et al., 2010; Trindade & Ferreira, 2014).

Over the years, literature has stressed the existence of several mediators of the relationship between body image-related variables and eating psychopathology, especially maladaptive emotion regulation processes. However, recently, some investigators pointed out the need of a larger investment in the study of adaptive regulation processes regarding the phenomenology of body image (Tylka, 2011), namely self-compassion. The ability to be self-compassionate is associated to the adoption and display of more useful and effective strategies and actions (Neff, 2003a, 2003b; Neff, Hsieh, & Dejitterat, 2005), and therefore known to entail positive consequences for psychological functioning and emotional health (Neff, 2003a). Moreover, growing evidences draw attention to the protective properties of these compassionate competencies in face of difficulties associated to eating psychopathology (Ferreira et al., 2013).

Beyond that, body image is a multidimensional concept of both negative and positive valences (Cash, 2002). In the past, researchers aimed at describing and predicting negative body image, namely by exploring body dissatisfaction, though, currently, the focus has shifted to identifying, predicting, and promoting adaptive body-related attitudes such as body appreciation (Avalos, Tylka, & Wood-Barcalow, 2005), stated as being inversely related to body dissatisfaction (Avalos et al., 2005; Tylka & WoodBarcalow, 2015b). In point of fact, body appreciation is a central characteristic of positive body image which can be conceptualized as the detention of a compassionate attitude towards one's own self and body image, i.e., the ability to be kind and understanding toward perceived flaws in appearance, and to recognize them as a common experience shared among humans (Marta-Simões, Mendes, Oliveira, Trindade, & Ferreira, 2016). More specifically, body appreciation is characterized by: (a) holding favorable opinions regarding one's own body (independently of its actual physical appearance); (b) accepting the body despite its weight,

shape and imperfections; (c) respecting the body by meeting its needs and engaging in healthy behaviors; and (d) protecting the body against media-promoted unrealistic appearance ideals (Avalos et al., 2005). Lately, this concept gained special prominence by being considered promising for research, prevention, treatment, and interventions in educational settings (Cook-Cottone, 2015; Tylka & Wood-Barcalow, 2015a, 2015b; Wood-Barcalow, Tylka, & Augustus-Horvath, 2010) due to its association with several indicators of psychological well-being (e.g., proactive coping, positive affect and self-compassion; Avalos et al., 2005; Tylka, 2011; Wasylkiw, MacKinnon, & MacLellan, 2012).

The current study aims to enhance recent research on the impact of different (maladaptive and adaptive) emotion regulation processes in eating psychopathology. Specifically, this study aims to clarify the distinct effects of body image-related cognitive fusion and body appreciation in the relationship between negative perceptions about one's body image and the enactment of disordered eating behaviours, while controlling the effect of BMI. It is hypothesized that body image-related cognitive fusion may exacerbate the impact of body image discrepancy in the engagement in disordered eating attitudes and behaviours. On the other hand, it is expected that body appreciation may lessen the impact of negative perceptions about one's body image in the severity of eating psychopathology.

METHOD

Participants

Participants were 369 women from general population, aged between 18 and 55 years old ($M = 26.84$; $SD = 8.74$). Participants' Body Mass Index (BMI) presented a mean

of 23.21 kg/m^2 (*SD* = 4.90), which corresponds to normal weight values, according to the conventional classification (WHO, 1995). Furthermore, the sample's BMI distribution revealed to be equivalent to the female Portuguese population's BMI distribution (Poínhos et al., 2009).

Measures

Before answering to self-report measures, participants provided demographic information (e.g., gender, age and education level) and their current weight and height.

Body Mass Index (BMI): Participants' BMI was calculated using the Quetelet Index from self-reported participants' height and weight (Kg/m^2).

Figure Rating Scale (FRS; Thompson & Altabe, 1991; Ferreira, 2003): FRS is an instrument to assess body image. This scale includes nine silhouettes of different sizes, presented in ascending order, from number 1 (the thinner body shape) to number 9 (the larger body shape). In this study, participants were asked to choose two silhouettes: one that best represents their current body image and another that best represents their ideal one. The degree of discrepancy between the current and idealized body image was calculated through the difference between the two silhouettes. This scale has good temporal reliability, as well as good convergent and divergent validities (Thompson & Altabe, 1991).

Cognitive Fusion Questionnaire-Body Image (CFQ-BI; Ferreira et al., 2013): CFQ-BI is a 10-item self-report measure of body image-related cognitive fusion (e.g., "I

tend to get very entangled in my thoughts concerning my body or body image"). Participants were asked to select a number on a 7-point scale (1 = "Never true" to 7 = "Always true") which best represents their agreement with each item. Higher scores on CFQ-BI indicate higher levels of cognitive fusion or entanglement with unwanted thoughts regarding one´s body image. This scale presents a unidimensional structure and revealed good psychometric properties in the original study (α = .97).

Body Appreciation Scale-2 (BAS-2; Tylka & Wood-Barcalow, 2015a; Marta-Simões et al., 2016): BAS-2 is a 10-item measure designed to assess individuals' acceptance and respect for their bodies, regardless of its appearance (e.g., "I take a positive attitude toward my body" or "I appreciate the different and unique characteristics of my body"). Participants were asked to rate their agreement with each sentence on a 5-point scale (1 = "Never" to 5 = "Always"). BAS-2 revealed to be a psychometric sound measure of positive body image (with Cronbach's alpha ranging between .93 and .97 in different samples; Tylka & Wood-Barcalow, 2015a).

Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994; Machado et al., 2014): EDE-Q is a 36-item self-report questionnaire of disordered eating based on the EDE's interview, which is considered a "gold standard" measure of eating psychopathology. This measure comprises four subscales: restraint, eating concern, shape concern, and weight concern, which allow to obtain a global score of eating psychopathology. The items are rated for their frequency of occurrence and for their severity, within a 28-days' time frame. This scale has shown to be a valid and reliable

instrument, with high values of internal consistency (α = .94, for both the original and the Portuguese versions).

The Cronbach's alphas for each study variables for two groups are presented in Table 1.

Procedures

The current study is part of a wider Portuguese research about the impact of emotional experiences and emotion regulation processes in the psychological functioning and mental health.

To conduct the current study all ethical requirements were met. Participants were collected through private messages on Facebook and were asked to share it with two more friends (Exponential Non-Discriminative Snowball Sampling method). Participants gave their written informed consent after being fully informed about the voluntary and confidential nature of their participation and also about the purpose, procedures and aims of the study. Participants answered to a set of self-report measures during 10-15 minutes.

The original sample comprised 392 individuals of both genders (17 men and 375 women) with ages ranging from 17 to 57 years old. However, according to the aims of this study, only 369 participants were selected, resulting in an all females sample. Data cleaning procedures excluded: (a) male participants and (b) participants younger than 18 or older than 55 years old.

Data analysis

Data analyses were performed using IBM SPSS Statistics 22.0 (IBM Corp, 2011) and path analyses were examined using the software AMOS (Arbuckle, 2008).

Descriptive statistics (means and standard deviations) were used to explore the characteristics of the final sample regarding the studied variables. Furthermore, Pearson product-moment correlations were conducted (Cohen, Cohen, West, & Aiken, 2003) and coefficients were analyzed in regarding the relationships established between body mass index (BMI), body image discrepancy (BID), body image-related cognitive fusion (CFQ-BI), body appreciation (BAS_2) and disordered eating attitudes and behaviours (EDE-Q). Correlations' magnitudes were discussed taking into account Cohen's guidelines, in which correlations ranging between .1 and .3 are considered of weak magnitude, moderate above .3 and strong those correlations equal or superior to .5, considering a significance level of .05 (Cohen et al., 2003)

Path analysis were performed to assess whether body mass index and body image discrepancy (entered as exogenous variables) predict disordered eating attitudes and behaviours (considered as an endogenous variable), through the mechanisms of body image-related cognitive fusion and body appreciation (entered as mediator variables).

The Maximum Likelihood method was conducted to estimate regression coefficients and fit statistics. Furthermore, a set of goodness-of-fit indices were used to examine the adequacy of the model to the empirical data (e.g., CMIN/DF, CFI, TLI and RMSEA). Resorting to the Bootstrap resampling procedure, the significance of the paths was examined with 5000 samples and 95 % bias-corrected confidence intervals (CI) around

the standardized estimates of total, direct and indirect effects. Effects with values under .05 were considered statistically significant.

RESULTS

Preliminary data analyses

The analysis of Skewness and Kurtosis values seems to confirm the assumption of the normal distribution of the variables in study (Kline, 2005). Data's suitability was tested by preliminary analyses, leading to the conclusion of linearity, independence of errors, normality, homoscedasticity, as well as singularity and absence of multicollinearity between variables (Field, 2004).

Descriptive and correlations analyses

Descriptive statistics and Pearson´s correlations are presented for the total sample ($N = 369$) in Table 1.

Results demonstrated that body mass index (BMI) presented positive associations with body image discrepancy (BID), body image-related cognitive fusion (CFQ-BI) and disordered eating attitudes and behaviours (with strong, weak and moderate magnitudes, respectively). Furthermore, BMI was significantly and negatively associated with body appreciation, albeit with weak magnitude. In turn, a positive correlation was found between body image discrepancy and body image-related cognitive fusion and EDE-Q (with moderate and strong magnitudes, respectively). On the other hand, BID revealed a negative

and moderate association with body appreciation, and body image-related cognitive fusion was negatively and strongly associated with body appreciation. Also, this variable was positively and strongly correlated with EDE-Q. Finally, body appreciation showed a negative and strong association with the engagement in disordered eating attitudes and behaviours.

Table 1
Cronbach's alpha (α), Means (M), Standard Deviations (SD), and intercorrelation scores on self-report measures (N = 369)

Measures	*M*	*SD*	*α*	1	2	3	4	5
1. BMI	23.21	4.90	-	1	-	-	-	-
2. BID	.92	1.02	-	.56***	1	-	-	-
3. CFQ_BI	25.31	13.6	.97	.15**	.36***	1	-	-
4. BAS-2	36.15	7.33	.94	-.27***	-.48***	-.67***	1	-
5. EDE_Q	1.57	1.25	.93	.37***	.60***	.72***	-.67***	1

Note: BMI = Body Mass Index; BID = Body Image Discrepancy; CFQ-BI = Cognitive Fusion Questionnaire-Body Image; BAS_2 = Body Appreciation Scale - 2; EDE-Q = Eating Disorder Examination Questionnaire. **$p < .01$; ***$p < .001$

Path analysis

The main goal of this path analysis was to test the role played by body image-related cognitive fusion (CFQ_BI) and body appreciation (BAS_2) in the association between body image discrepancy (BID) and disordered eating attitudes and behaviours (EDE_Q), while controlling the effect of BMI.

The tested model was explored through a fully saturated model (i.e., with zero degrees of freedom), comprising 15 parameters and explained 67% of the eating psychopathology's variance (EDE_Q). In this model, two paths were not significant: the direct effect of body mass index on body appreciation (b_{BMI} = -.009; SE_b = .082; Z = -.113; p = .910) and on body image-related cognitive fusion (b_{BMI} = -.210; SE_b = .123; Z = -

1.703; p = .088). In accordance with these results, the non-significant paths were eliminated and the model recalculated.

The final model (Figure 1) explained 13%, 23% and 67% of the CFQ_BI, BAS_2 and EDE_Q's variance, respectively. All path coefficients were statistically significant ($p <$ .05) and in the expected directions. Results revealed an excellent model fit, with a non-significant Chi-square [$\chi^2_{(2)}$ = 2.903; p = .234] and reveled an excellent fit to the empirical data (CMIN/DF = 1.452; CFI = .999; TLI = .995; RMSEA = .035, IC = .000 - .115; p = .505; Kline, 2005).

Specifically, body image discrepancy presented a direct effect of .36 (b_{BID} = 4.610; SE_b = .622; Z = 7.413; p = < .001) on body image-related cognitive fusion of -.48 (b_{BID} = -3.464; SE_b = .328; Z = -10.568; p = < .001), on body appreciation of .29 (b_{BID} = .354; SE_b = .049; Z = 7.227; p = < .001), and on EDE_Q. In turn, body mass index only showed a direct effect of .08 (b_{BMI} = .021; SE_b = .009; Z = 2.264; p = .024) on EDE_Q. Furthermore, body image-related cognitive fusion and body appreciation had a direct effect on EDE_Q of .48 (b_{CFQ_BI} = .047; SE_b = .004; Z = 11.901; p = < .001), and of -.18 (b_{BAS_2} = -.031; SE_b = .007; Z = -4.163; p = < .001), respectively. Moreover, the analysis of the indirect effects allowed us to identify that body image discrepancy presented an indirect effect on EDE_Q, of .26 (95% CI = .20 to .33), which was partially mediated through the mechanisms of body image-related cognitive fusion and body appreciation.

Overall, the model accounted for 67% of EDE_Q and revealed that the impact of body image discrepancy in eating psychopathology was partially carried by body image-related cognitive fusion and body appreciation.
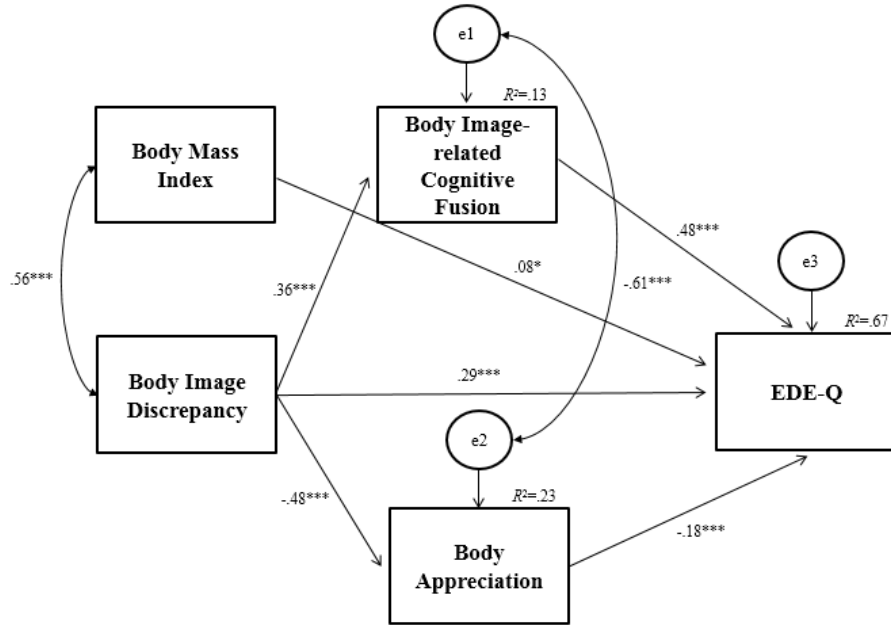
Figure 1. Final path model.

Note: Standardized path coefficients among variables are presented. All path coefficients are significant at the .05 level; *p < .05; ***p < 0.001.

DISCUSSION

The association between a higher BMI and a higher body image discrepancy is stated by recent literature as a potential predictor of a larger engagement in disordered eating behaviours (Ferreira et al., 2014; Mendes et al., 2016; Trindade & Ferreira, 2014). Despite the direct impact of these variables, there is evidence that its role on eating psychopathology may be influenced by different emotion regulation processes (Ferreira et al., 2014; Mond et al., 2013; Pinto-Gouveia et al., 2014; Segal et al., 2004). Therefore, the present study aimed to explore how body image-related cognitive fusion and body appreciation mediate the impact of key risk factors of eating psychopathology (such as

body image discrepancy) on the engagement in disordered eating behaviours, while controlling the effect of BMI.

Our findings seem to corroborate literature (Neumark-Sztainer et al., 2003; Stice et al., 2011) and are in accordance with our hypothesis, showing that BMI and body image discrepancy are positively associated with the severity of eating psychopathology. Furthermore, these results confirm previous studies disclosing that body image-related cognitive fusion (e.g., Ferreira et al., 2014; Ferreira & Trindade, 2014; Ferreira et al., 2013; Trindade & Ferreira, 2014) and body appreciation (e.g., Avalos et al., 2005) presented a strong association with EDE-Q (with negative and positive correlations, respectively).

A path analysis further examined these associations by testing the impact of body image discrepancy on EDE-Q, and the mediator role of body image-related cognitive fusion and body appreciation, while controlling the effect of BMI. Findings revealed that the tested model explained 67% of eating psychopathology's variance, within excellent model fit indices. Furthermore, while controlling BMI's effect, results indicated that women who perceived their body as significantly discrepant from the socially and culturally idealized thin figure have a greater tendency to engage in disordered eating attitudes and behaviours. Moreover, body image discrepancy revealed a positive direct effect on disordered eating, and an indirect effect, mediated by increased body image-related cognitive fusion and decreased body appreciation. In other words, the current findings indicated that negative body image perception directly explains the engagement in disordered eating behaviours, but its impact is also operated through the mechanisms of body image-related cognitive fusion and body appreciation.

The analysis of the proposed model allowed us to confirm the distinct effects of body image-related cognitive fusion and body appreciation, and its crucial role as emotion

regulation processes that mediate the impact of body image subjective experiences on eating psychopathology. These conclusions point out that the perceived discrepancy between one´s current and idealized body image impacts, by itself, on the engagement in disordered eating attitudes and behaviours. However, its impact is even more expressive when women get entangled and fused with such negative perceptions, feelings or sensations. Specifically, being cognitively fused with negative evaluations about one's own body enhances the probability of reacting to unwanted internal experiences as if they were facts or absolute truths, without understanding the subjective and transitory character of such experiences. Also, cognitive fusion with body image may trigger experiential avoidance strategies (attempts to avoid, control or modify undesired internal experiences), such as drive for thinness and control of eating behaviours, which are associated with disordered eating. Nevertheless, these strategies tend to intensify the pain and suffering associated to internal experiences (Hayes et al., 2006; Hayes, Strosahl, Wilson et al., 2004) and hamper the adoption of adaptive behaviours (Gross, 2002). On the other hand, body appreciation, due to the associated ability to be kind and understanding toward perceived flaws in appearance, and to recognize them as shared by all (Marta-Simões et al., 2016), seems to reduce the impact of the negative body image evaluation in the severity of eating psychopathology. Our findings indicate that body image-related cognitive fusion and body appreciation are key processes to explain the impact of negative body image on the engagement in disordered eating behaviours. In point of fact, the present paper argues that the impact of body image discrepancy in the tendency to eating psychopathology is mediated through high levels of body image-related cognitive fusion and low levels of body appreciation.

However, some limitations should be noticed. Firstly, the main limitation of the present study is its cross-sectional nature, which does not allow the inference of causal relationships between variables. In future research, a longitudinal exploration should be conducted to determine the directions of the studied associations over time. Another limitation is the use of a sample exclusively composed of women from the general population. Even though the engagement in disordered eating behaviours is much more prevalent in females, upcoming studies should investigate this model in male samples and analyse the differences between both genders. Furthermore, it would be important to explore this model in clinical samples (e.g., obese and eating disordered patients). Lastly, another possible limitation is related to the use of self-report measures that could skew and compromise the generalization of the data. Thus, future research should include other assessment methods, in order to corroborate the obtained results.

Despite these limitations, the present study seems to corroborate the hypothesis that the impact of body image discrepancy in disordered eating attitudes and behaviours is partially carried by the effect of maladaptive and adaptive emotion regulation processes, that is, by higher levels of cognitive fusion and low levels of body appreciation.

Additionally, our results seem to offer relevant contributions for research and clinical practice in the field of body image and eating difficulties, providing empirical support for the target and promotion of cognitive defusion and self-compassionate attitudes as protective emotion regulation strategies against eating psychopathology.

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